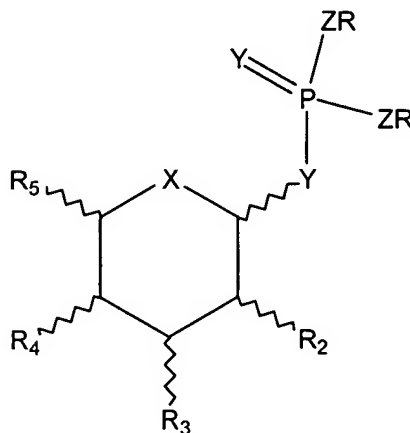


Claims:

1. (currently amended) A compound represented by structure 1:



1

wherein

X represents O;

Y represents independently for each occurrence O;

Z represents independently for each occurrence O;

R is selected, independently for each occurrence, from the group consisting of [[H,]] alkyl, heteroalkyl, aralkyl, heteroaryl, and heteroaralkyl;

R' is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl;

R'' is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aralkyl, heteroaryl, and heteroaralkyl;

R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are independently selected from the group consisting of R<sub>6</sub>, -OR', -SR', -NR'<sub>2</sub>, -OSO<sub>3</sub>H, and -OPO<sub>3</sub>H<sub>2</sub>;

R<sub>5</sub> is selected from the group consisting of R<sub>6</sub>, ~~-(CR<sub>2</sub>)<sub>n</sub>OR'~~, -(CR''<sub>2</sub>)<sub>n</sub>OR', ~~-(CR<sub>2</sub>)<sub>n</sub>SR'~~, -(CR''<sub>2</sub>)<sub>n</sub>SR', and ~~-(CR<sub>2</sub>)<sub>n</sub>NR'<sub>2</sub>~~ -(CR''<sub>2</sub>)<sub>n</sub>NR'<sub>2</sub>;

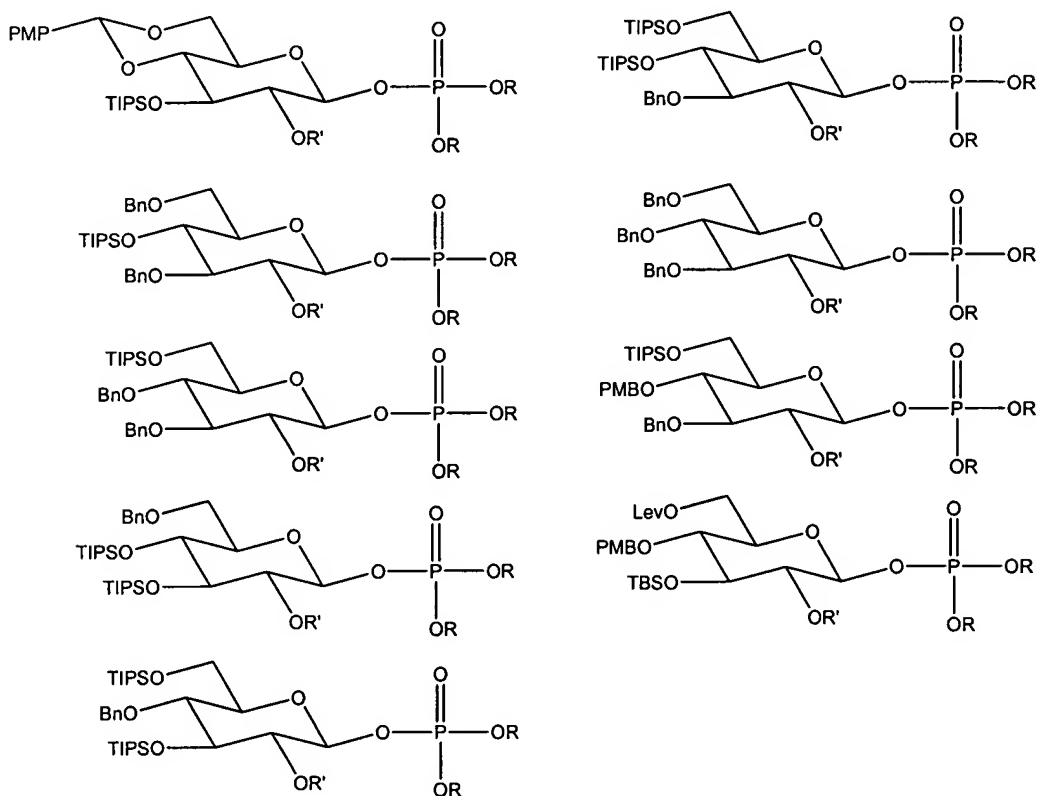
R<sub>6</sub> is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, and heteroaralkyl; and

n is an integer selected from the range 0 to 10 inclusive.

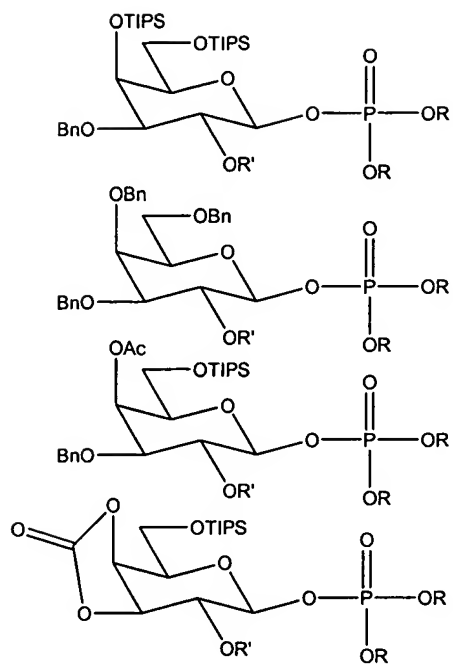
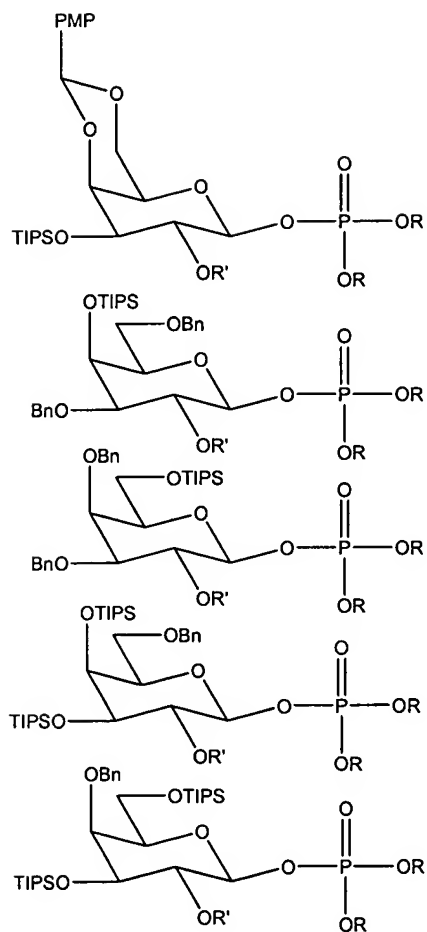
Claims 2-22 (canceled)

23. (previously presented) The compound of claim 1, wherein said compound is represented by one of the following structures:

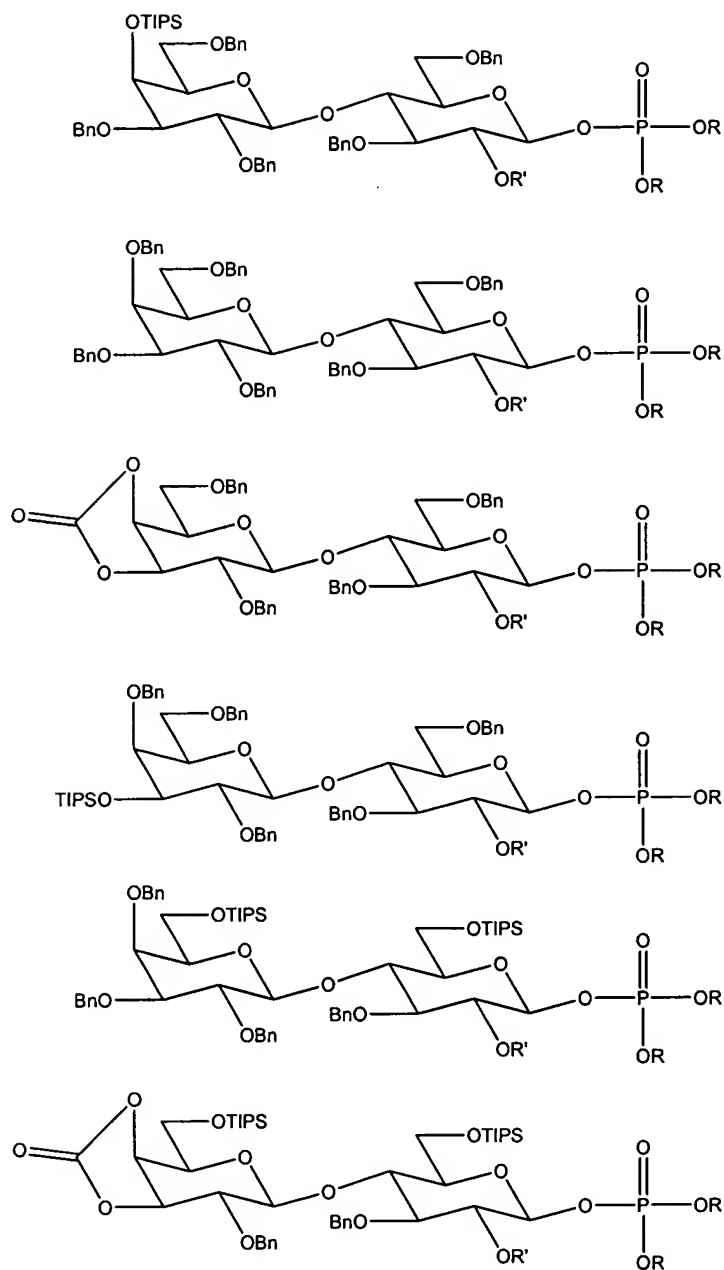
Glucose



# Galactose



# Lactose



wherein

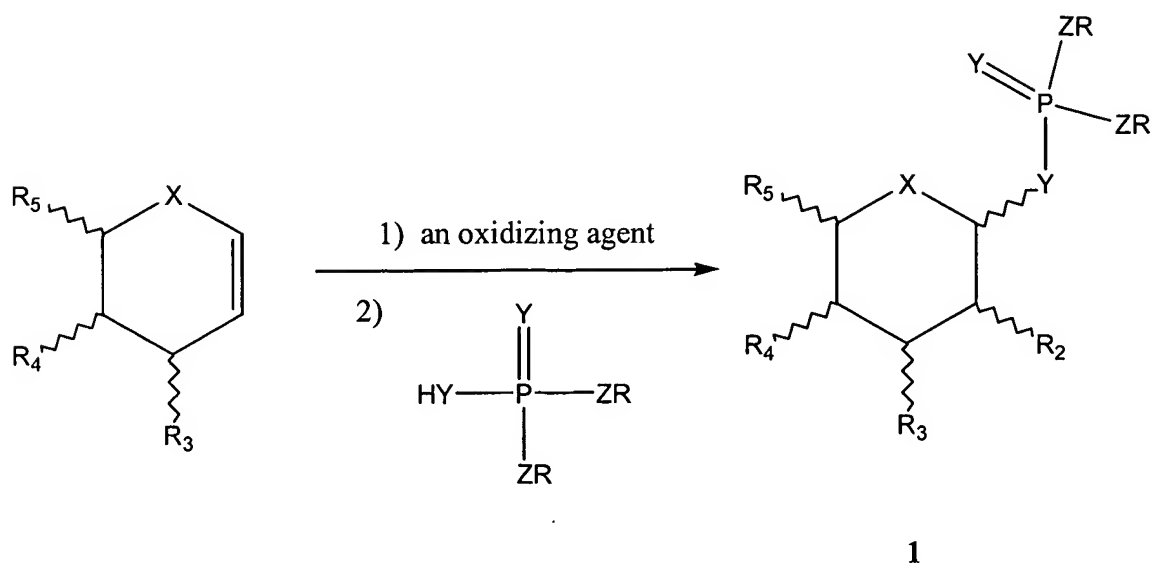
TIPS represents triisopropylsilyl;

PMP represents paramethoxyphenyl; and

Bn represents benzyl.

Claims 24-41 (**canceled**)

42. (previously presented) A method of synthesizing a compound represented by 1, wherein said method is represented by the following scheme:



wherein

$X$  represents  $O$ ;

$Y$  represents independently for each occurrence  $O$ ;

$Z$  represents independently for each occurrence  $O$ ;

the oxidizing agent is selected from the group consisting of dioxiranes, percarboxylates, and persulfates;

$R$  is selected, independently for each occurrence, from the group consisting of  $H$ , alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, and heteroaralkyl;

$R'$  is selected, independently for each occurrence, from the group consisting of  $H$ , alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl;

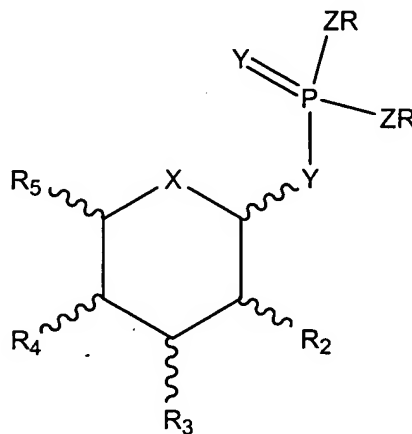
$R_2$  is  $OR'$ ;

$R_3$ , and  $R_4$  are independently selected from the group consisting of  $R$ ,  $-OR'$ ,  $-SR'$ ,  $-NR'_2$ ,  $-OSO_3H$ , and  $-OPO_3H_2$ ;

$R_5$  is selected from the group consisting of  $R$ ,  $-(CR_2)_nOR'$ ,  $-(CR_2)_nSR'$ , and  $-(CR_2)_nNR'_2$ ; and

$n$  is an integer selected from the range 0 to 10 inclusive.

43. **(original)** The method of claim 42, wherein the oxidizing agent is a dioxirane.
44. **(original)** The method of claim 43, wherein the oxidizing agent is dimethyl dioxirane (DMDO).
45. **(currently amended)** A compound represented by structure 2:



2

wherein

X represents O;

Y represents independently for each occurrence O;

Z represents independently for each occurrence O;

R represents independently for each occurrence aryl;

R' is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl;

R'' is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, and heteroaralkyl;

R<sub>2</sub> is selected from the group consisting of R<sub>6</sub>, -OR', -SR', -NR'<sub>2</sub>, -OSO<sub>3</sub>H, and -OPO<sub>3</sub>H<sub>2</sub>;

R<sub>3</sub>, and R<sub>4</sub> are independently selected from the group consisting of R<sub>6</sub>, -OR<sub>7</sub>, -SR', -NR'<sub>2</sub>, -OSO<sub>3</sub>H, and -OPO<sub>3</sub>H<sub>2</sub>;

$R_5$  is selected from the group consisting of  $R_6$ ,  $-(CR_2)_nOR^2$ ,  $-(CR''_2)_nOR^2$ ,  $-(CR_2)_nSR^2$ ,  $-(CR''_2)_nSR^2$ , and  $-(CR_2)_nNR'^2$ ,  $-(CR''_2)_nNR'^2$ ;

$R_6$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, and heteroaralkyl;

$R_7$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, heteroaryl, heteroaralkyl, and sulfonyl; and

$n$  is an integer selected from the range 0 to 10 inclusive.

46. **(new)** The compound of claim 45, wherein  $R_2$  is selected from the group consisting of  $R_6$ ,  $-SR^2$ ,  $-NR'^2$ ,  $-OSO_3H$ , and  $-OPO_3H_2$ .
47. **(new)** The compound of claim 45, wherein  $R_5$  is selected from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl,  $-(CR''_2)_nOR^C$ ,  $-(CR''_2)_nSR^S$ , and  $-(CR''_2)_nN(R^N)_2$ ;  $R^C$  is selected from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, and sulfonyl;  $R^S$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl; and  $R^N$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl.
48. **(new)** The compound of claim 1, where in  $R$  is selected, independently for each occurrence, from the group consisting of alkyl, heteroaryl, and heteroaralkyl.
49. **(new)** The compound of claim 1, wherein  $R_5$  is selected from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl,  $-(CR''_2)_nOR^C$ ,  $-(CR''_2)_nSR^S$ , and  $-(CR''_2)_nN(R^N)_2$ ;  $R^C$  is selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, heteroaralkyl, acyl, and sulfonyl;  $R^S$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl; and  $R^N$  is selected, independently for each occurrence, from the group consisting of H, alkyl, heteroalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, acyl, and sulfonyl.